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Prison Gangs and the Community Responsibility System*

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ABSTRACT

Why do prison gangs exist? Despite the prominence of formal governance mechanisms, inmates also require self-governance institutions to facilitate illicit trade. This article examines how inmates enforce agreements in the illicit contraband trade and how they resolve social disputes. We first describe how the informal prison society operates as a community responsibility system. We then present a model of prison gang organization that accounts for both environmental factors and the endogenous actions of the prison administration, encapsulated in the “warden.” We find that gangs organize based on exogenous characteristics. The “warden” diffuses gang influence by maintaining the oligopolistic structure, which limits contraband but allows for orderly private allocation of prison-provided goods and dispute resolution.

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1 Introduction

Prior to the 1950s, prison gangs did not exist in any state or federal correctional facilities in the United States; prison gangs have now proliferated throughout the nation's prisons and jails (Camp and Camp, 1985). What factors account for prison gang growth? Based on television and film depictions of prison life the answer may seem obvious: racist inmates join gangs to participate in tribal warfare against inmates of other races. By this explanation, gangs form to engage in violence, and in fact, correctional officials frequently report that gangs form to "promote violence" (California Department of Corrections and Rehabilitation, 2012b, p. 2). However, this contradicts the broader empirical pattern of prison misconduct. Over the same period that the number of prison gangs and gang members has increased, prison violence has declined dramatically. For instance, the rate of inmate homicides declined 94% between 1973 and 2003 (Useem and Piehl, 2008, pp. 81–115). Research has also found that some prison gang members are no more likely to engage in violent misconduct behind bars than non-gang inmates (Gaes *et al.*, 2002), and they are not more likely to be incarcerated for a violent offense (California Department of Corrections, 1975, p. 67). If inmates form gangs primarily to facilitate violence, they are not succeeding. Likewise, a second puzzle arises from the depiction of gangs as promoting hateful, racist ideologies. Racially discriminatory behaviors and beliefs appear to have been declining since at least the 1940s (Pinker, 2012, pp. 464–473). If society is becoming more tolerant, then we should see a decline rather than an increase in gangs that purportedly form to promote racism. Despite popular depictions of prison gangs, neither a desire for violence nor racism appears consistent with broader trends.

We offer a different explanation for prison gangs. In short, inmates join gangs to promote cooperation and trust, which facilitates illegal contraband markets. Prison gangs form to provide extralegal governance in social and economic interactions. Our theory is well expressed by an expert on prison gangs, a Hispanic male who served six years in the California prison system for robbery and assault. He explains:

The boys inside, they follow the rules and that means you work with your own boys and do what they say. Look, there is a lot of problems caused by the gangs, no doubt. The thing is, they solve problems too. You want a structure and you want someone to organize the businesses so the gangs have their rules. You don't run up a drug debt, you don't start a fight in the yard and stuff. Gangs are a problem but we took care of business. There is a code of silence, you don't talk about all the

stuff with others, the cops split up gangs if there's a big problem so we keep to ourselves and mind our own business

(Trammell, 2009, p. 755).

Our explanation of prison gang activity suggests different predictions about gang behavior and is consistent with broader trends about violence and racial tolerance. It also suggests quite different policies for prison wardens and others interested in reducing violence within prisons.

More generally, the problem facing inmates is one that has faced people throughout history: how can people engage in trade in the absence of strong, effective governments. An extensive literature examines the effectiveness of self-enforcing exchange. Theoretical work suggests that it will be effective in small, close-knit communities, with good information, populated by people with low time preference who interact indefinitely.¹ Empirical work shows that these are often sufficient conditions for trade. Decentralized legal systems work especially well within groups characterized by ethnic and religious homogeneity. Self-governance has proven effective in remarkably diverse settings from the distant past to the modern day.²

However, eliciting social cooperation is more difficult when it takes places among people from different groups. Traders may not share the same language, culture, mental models, social knowledge, family ties, religion, and history that facilitate information transmission, reputation, and punishment mechanisms within groups. Punishing opportunistic behavior has public good characteristics, so the greater diversity that exists between groups tends to undermine enforcement (Habyarimana *et al.*, 2007). Multiple groups may find it more difficult to converge on an accepted standard of behavior and the proper sanctions for infringements. People are less likely to have other-regarding preferences for non-group members. By definition, different groups are less tightly knit, making monitoring and punishment of opportunistic behavior more difficult.

Nonetheless, important work identifies mechanisms that allow intergroup trade to thrive. Leeson (2008) examines pre-colonial African trade, showing that for-

¹ Powell and Stringham (2009) survey the literature on self-enforcing exchange, and see also classic work by Axelrod (1984). Dixit (2004) provides a superb theoretical discussion of lawlessness and economics. Bush and Mayer (1974) present a model of property rights emergence in anarchy, which was followed by work from Hirshleifer (1995, 2001), Skaperdas (1992), and Sutter (1995).

² See important works by Umbeck (1977a,b, 1981), Friedman (1979), Landa (1981, 1994), Benson (1989, 1990), Greif (1989, 1993), Milgrom *et al.* (1990), Ellickson (1991), Bernstein (1992), Clay (1997), Stringham (2003), Anderson and Hill (2004), Richman (2006), Schaeffer (2008), and Koyama (2012).

eigners were able to trade with locals by finding ways to signal their trustworthiness ex-ante, in part, by adopting local religion and language. Traders used credit instruments to exchange with parties where there was a substantial asymmetry of power and therefore insecure property rights (Leeson, 2007b). The constitutional-democratic governance mechanisms used by racially diverse pirates made them effective plunderers (Leeson, 2007a, 2009a,b, 2010). A decentralized legal system known as the *Leges Marchiarum* maintained order between warring members of adversarial groups along the Anglo-Scottish borderland (Leeson, 2009b).³ These studies suggest that real-world governance institutions can emerge to solve a variety of intergroup coordination and cooperation problems.

In particular, a community responsibility system (CRS) has often played an important role in governing social interactions (Fearon and Laitin, 1996; Greif, 2006a,b, pp. 309–349). In such a system, all members of the group are responsible for the actions and debts of any other member. Consider a situation where a member of Group A borrows money from a member of Group B. If Member A defaults on the debt, then all members of Group A are responsible for repaying it. If Group A does not suitably compensate Member B, then Group B boycotts Group A. If there are substantial benefits available from future interactions with Group B, then the threat of boycott induces payment by Group A. This system is especially effective when it is less costly to learn the trustworthiness of a group than to discern the trustworthiness of a stranger. Groups can monitor their members at lower cost than outsiders can, so they can punish bad behavior more easily. Moreover, the corporate nature of the group creates a repeated play scenario among groups even though particular members may never trade again. When groups have reputations for taking responsibility for its members' actions, then two members of different groups who do not know each other can still benefit from trade. Importantly, this takes place in a context of impersonal exchange, where two parties do not anticipate interacting in the future and each lacks the ability to report misconduct to future traders. The CRS provides a way for people to trade widely in the absence of an effective legal system.

To better understand the robustness of self-enforcing trade, this article focuses on two aspects of the community responsibility system. First, despite the effectiveness of the CRS in past studies, we know little about how robust it is to agent type. Successful merchants, for instance, may be more cooperative because of higher social standing or intelligence (Jones, 2008). We therefore examine a context where the

³ These results are robust across a number of different historical, commercial, and social settings (Leeson, 2005a,b, 2006, 2008).

people involved are more likely to be untrustworthy and closer to a “worst case” type than among successful commercial participants — prison. Inmates have relatively low levels of education, high discount rates, and low self-control (Glaeser, 1998; Lee and McCrary, 2005; Pratt and Cullen, 2000). We argue that inmates today use a CRS system to govern a contraband trade that takes place among a large group of heterogeneous people in California’s state prisons. Starting with classic works by Schelling (1971) and Gambetta (1993), a fascinating literature demonstrates that the distinguishing characteristic of mafia-like groups is that they provide governance when the state cannot or will not do so (Skaperdas, 2001; Varese, 2005, 2011; Sobel and Osoba, 2009). Using evidence from field interviews conducted by Trammell (2009, 2011), this article demonstrates the pivotal role played by prison gangs in providing extralegal governance in the inmate social system and finds that a CRS can be robust to agent type.

Second, past work has questioned the effectiveness of a CRS when group size is asymmetric. It is less costly for members of large groups to take advantage of members of small groups because they still have access to many trading partners should they be ostracized or boycotted by the small group (Fearon and Laitin, 1996; Leeson, 2005a,b). Based partly on Trammell’s research, past work has already argued that prison gangs form to provide governance (Skarbek, 2012, 2013), and previous research has examined the internal organization of a particular gang (Skarbek, 2010a,b; Leeson and Skarbek, 2010). A key question that has not been addressed in the literature, which we examine here in Section 3, is the question of optimal gang size, the optimal number of prison gangs, and the optimal response by officials. We develop a model to understand the optimal number of groups to operate within a CRS. One implication of the model is that groups have an incentive to limit their size so that they can credibly participate in a CRS. We use this model to understand what incentives an outside observer — in this case, a warden — would have to encourage group formation. Counterintuitively, the formation of groups within this “worst case” scenario serves to suppress rather than foster illicit activity and encourage order among inmates.

2 Prison Gangs Operate in a Community Responsibility System

Contraband goods and services are one of the most important ways that inmates ease the pains of imprisonment (Kalinich, 1980; Irwin, 1980; Kalinich and Stojkovic, 1985). Some of the most common types of contraband are drugs, alcohol, tobacco, and mobile phones. There are no reliable data on the volume of goods traded in

contraband markets, but anecdotal evidence suggests it is substantial.⁴ Former Warden Patrick Arvonio explains the widespread availability and use of drugs, noting “Nobody can convince me that there’s a county jail, a prison, a juvenile detention center, or any other place where you have drug addicts locked up, that there’s not drugs in the facility. There is no such place” (Levin, 1996). One report finds that 44 inmates in California prisons died of drug overdoses between 2005 and 2008 (Washington Times, 2010). More recently, a thriving market in mobile phones has arisen. The California Department of Corrections and Rehabilitation seized 15,000 phones from inmates in 2011 alone (California Council on Science and Technology, 2012). If we assume a 25 percent interdiction rate, this suggests there were 60,000 contraband phones behind bars. During 11 days at one prison, officials used a special device to detect more than 25,000 unauthorized calls, texts, and internet requests (California Department of Corrections and Rehabilitation, 2012a). Officials at the maximum-security prison at Corcoran even confiscated two cell phones from Charles Manson. Contraband markets are working.

Prison gangs play a central role in contraband activity (Irwin, 1980, p. 206; Blatchford, 2008). A prison gang is an “organization which operates within the prison system as a self-perpetuating criminally oriented entity, consisting of a select group of inmates who have established an organized chain of command and are governed by an established code of conduct” (Lyman, 1989, p. 48). Prison gangs often adopt written constitutions, have a lifetime membership requirement, and engage in criminal activity both behind bars and often on the street (Skarbek, 2010a,b; Skarbek, 2011). Nearly every prison gang restricts its membership to people of one race or ethnicity and often by an inmate’s area of geographic origin.

Not all California inmates are full “made” members of prison gangs, but many affiliate with some racial group or gang (Knox, 2006; Blatchford, 2012; Morales, 2008). In 2002, a high-ranking official testified that there were 40,000–60,000 gang members in California prisons, 25–38% of inmates (Petersilia, 2006, p. 35). Gang membership is so common that prior to a Supreme Court ruling in 2005, inmate reception forms asked an inmate to check a box to indicate with which gang he affiliated (Goodman, 2008). A gang investigator at Wabash Valley Correctional Facility describes gangs’ widespread influence, “What people don’t realize is that almost everything that happens in a prison setting has some sort of gang involvement, whether it be extortion, intimidations, trafficking narcotics. There’s nothing

⁴ Context specific studies consistently find that contraband is available and important. For instance, Kalinich (1980) and Kalinich and Stojkovic (1985) document the volume of contraband in a particular prison.

that goes on that at least one gang member is not involved with” (MSNBC, 2005). Prison officials report, “almost without exception...the gangs are responsible for the majority of drug trafficking in their institutions” (Camp and Camp, 1985, p. 52). As past work on P.O.W. camps and prisons has argued, inmates cannot rely on official mechanisms of social control to facilitate illicit markets (Radford, 1945; Sykes, 1958 [2007]; Kaminski, 2004). For instance, they cannot rely on correctional officers to enforce agreements made in drug deals, punish people who do not pay their drug debts, or knowingly protect a drug stash. For these illicit markets to operate, inmates must create extralegal governance institutions.

A CRS provides the institutional foundation that facilitates the contraband trade. Prison gangs and other inmate groups are the “communities” that inmates join. Nearly all inmates have to affiliate with a prison gang or inmate group. A correctional officer at Corcoran State Prison explains, “When you come to prison, you have to join a gang. You have no choice. It’s a must. Whatever race backs you up, you need to be in their gang. Because you have no protection. You’re on your own. And anything can happen to you” (MSNBC, 2009).⁵

As an inmate enters the prison system, both correctional officers and other inmates tell him that he must affiliate with a gang. An inmate who was incarcerated for five years for assault with a deadly weapon explains, “I’m a white guy, so I can only hang with white guys in prison. The COs [correctional officers] told me that I would only run with the white guys. I knew that going in, but they told me too. A guy, a white guy, came up to me right away and told me to get with the skins and I’d be okay.” (Trammell, 2011, p. 27).

The more extensively an inmate wishes to engage in the underground economy, the more important it is that he affiliates with a gang. When conflicts arise, an inmate can appeal to his own group’s leader to meet with the leader of the offending inmate’s group. If the offending member is not affiliated with a group, then there is no community that can put pressure on him to make restitution or to do so themselves. As such, social and commercial interactions with an unaffiliated inmate face a higher risk of opportunism. Inmates encourage everyone to have an affiliation. For instance, one white inmate explains how he and his associates would complain to inmates from other races if they did not quickly bring new inmates into the fold. He explains, “The black dudes were slow at training their new guys. When they [white inmates] come in, we have a talk and set them straight. My boys were on it; you cannot fuck around and let this slide. The Mexicans, they know what’s

⁵ A lieutenant at San Quentin State Prison communicated the same message to one of the authors on a visit to the facility.

what and they were quick, but the black guys, that's a different story. I had to remind them several times, you know, 'You have a new boy on the yard' and stuff" (Trammell, 2011, p. 28). If new inmates do not align with a group, then a CRS operates less effectively.

Inmates must be able to credibly signal their affiliation to strangers. This ensures that a gang is not held responsible for the actions of non-members. Inmates signal gang affiliation in several ways. First, nearly all gangs are racially segregated. An inmate's race is the most easily observed characteristic in an all-male environment with standard-issue clothing. This information identifies to which subset of all prison gangs an inmate might belong. Second, gang members often get prominent tattoos that identify their affiliation (Valentine, 2000). Inmates wear these on their necks, arms, hands, and faces. Because these tattoos are prominent and permanent, they provide a credible signal of one's group affiliation (Kaminski, 2003, 2004; Gambetta, 2009). Strangers know with whom they can trade by their group affiliation, and members cannot avoid taking responsibility for their associates.

Active participation in the underground economy requires membership in the community responsibility system, and all gang members are responsible for any member's actions. For example, if a member of Gang A purchases drugs on credit from someone in Gang B, then Gang A is responsible for his payment of that debt. If the individual does not pay, then the drug dealer can appeal to the leaders of Gang A for relief. The leader, or "shot caller" in prison parlance, will either pay the debt, force his member to pay the debt or work for them (perhaps assaulting an enemy of Gang B), assault the inmate to appease the drug dealer, or hand him over to Gang B to assault him in a controlled manner. As one prison gang member explains, "It was my responsibility on the yard to ensure that . . . our people were not harmed by another race. I took care of the drug debts. If one of our people became delinquent in a drug debt to another race, it was my responsibility to either cover their drug debt or have them stabbed. In which case, we would send one of ours to stab him" (MSNBC, 2009). If the drug dealer from Gang B is confident that Gang A has a good reputation for taking responsibility for its members' actions, then he will be willing to sell drugs on credit to people whom he does not know personally.

A former inmate describes self-policing in the system, "If one of my guys is messing up then we either offer him up to the other guys or we take him down ourselves. Like I had a guy that ran up a big drug debt, he owed money to the woods [peckerwood skin-head gang] and I had to turn him over to them. They took him to a cell and really beat the shit out of him. We had to do it. If not, then everyone fights

which is bad for business and bad for us” (Trammell, 2009, pp. 763–764). Gangs hold members responsible so that they can continue to conduct illicit business.

Prison gangs resolve both social and commercial conflicts among inmates. Disputes arise when inmates feel disrespected, drug deals and drug debts go wrong, and when stolen from (Trammell, 2011, p. 90). The shot callers monitor inmates’ behavior and seek out solutions when problems arise. A former inmate in California explains, “So here’s the deal, you got old guys like me who have been in prison forever and have shot-callers do their job, keep peace and run the action. That’s why we have shot-callers so when a couple of idiots get into it in the yard, instead of letting them kill themselves, the shot-caller goes out and works it out. He talks to these guys and finds out what happened, who did what to who it’s very simple” (Trammell, 2009, pp. 762–763).

A white inmate who served eight years in prison describes the in-group policing practiced by gangs, “I knew this guy that ran his mouth a lot, made lots of problems, called people names and stuff. He called these Mexican guys a bunch of greasy wetbacks. He’s a loose cannon, he’s going to cause trouble you know what I mean, we work hard to keep that race shit calm and here is this prick causing trouble, no one wants that so we had to check him. We took him down a peg or two, it came right from the top, the asshole needs a lesson” (Trammell, 2009, p. 764). A black inmate explains how gangs establish order by enforcing rules about interacting with other groups. He explains that he was surprised to find his associates upset with him after he insulted a white inmate, “When I first got to prison, I said some shit to this white guy and the next thing I know, I’m told to make it right with him. I have to man up and take care of my shit. At first I thought, you gotta be kidding me. No way am I going to tell this guy that I’m sorry. Then they told me that I have no choice. That’s the rule, you do what you’re told. They made a very good argument about how I need to fall in line. Okay, so I made things right” (Trammell, 2009, p. 766). Another inmate explains, “if someone pisses me off, you know starts trouble with me, he has to answer to his own people. They decide if it’s worth fighting over you know? If they decide that he’s just a big dick and he needs to apologize to me for being a dick then he will tell me he’s sorry. That’s how it usually ends. Nothing too dramatic” (Trammell, 2009, p. 760).

An inmate who did eight years for manslaughter explains, “you can talk with the leaders if you want to fight, that’s fine, but you cannot just jump a guy in the yard ... The guards will see that something is up and they’ll start watching us ... you start bringing down another guy, and now everyone is involved and it’s a mess. So I say, look, talk to the leaders, see if they’ll let you take the guy down in

a blind spot or in their cell. Keep that shit low-key, right? No need to bring in the cops over some name calling. We can take care of that” (Trammell, 2011, p. 29). Another inmate explains, “if someone disses me or someone takes my stuff then the leaders tell us to take it to the cell. We slug it out and get things taken care of” (Trammell, 2009, pp. 760–761). Gangs provide governance.

3 Modeling the Organization of Prison Gangs

The primary purpose of a CRS within prison is to ensure the orderly functioning of a contraband market and to settle disputes amongst inmates. As such, gangs can be viewed as both firms (producers of contraband) and quasi-governments (providers of dispute resolution lying outside the scope of prison authorities).⁶ When considering gangs in the former sense, the question remains: what firm-like organizational costs facilitate the formation of gangs and why does an “oligopolistic” structure dominate the prison world? When considering gangs in the latter sense, as resolvers of disputes, the pertinent question is what sort of gang structure (if any) might be optimal from the perspective of resource-constrained prison authorities. To the extent that this optimal structure differs across the dual perspectives of the gang and the “warden”, the latter will use available resources to modify the prevailing prison environment.

3.1 A Model of the Optimal Number of Prison Gangs

There are numerous prison gangs in each prison, and multiple prison gangs of the same race. What determines the optimal number and size of prison gangs? Consider the average cost of operation per person to a prison gang as a function of its size, where size is defined as the absolute number of gang members.⁷ As a gang increases in size, the fixed costs of gang organization diminish on a per person basis. For example, it is easier for a gang to control a particular set of tables if there are more people there. Another benefit from increased size is that a larger gang can make use of members’ comparative advantages more extensively. For instance, internal FBI documents report that Aryan Brotherhood (AB) members “felt that the AB needed different types of individual’s with different skills and not

⁶ On the relationship between gangs and governments, see Skaperdas and Syropoulos (1995).

⁷ Naturally, an organization such as a prison gang will exhibit some form of hierarchy and, therefore, “degrees of membership” (see, e.g., Leeson and Skarbek, 2010). For the sake of expositional simplicity, however, assume that an inmate either is or is not a member of a gang.

just a mindless bunch of murderers. Attempts would therefore be made to recruit explosives experts, chemists, people with legal backgrounds, conmen, and people who would be able to run scams inside and outside the prison” (Federal Bureau of Investigation, 2012, p. 145). Gangs also establish particular roles and areas of specialization (Skarbek, 2010a,b; Mendoza, 2012). If increased size allows a gang to control a larger portion of the illicit trade, then they can also reduce the volume of trade and increase the price of contraband to monopoly levels.⁸ The function $\rho(n)$ in Figure 1 expresses this diminishing cost to gang operation.

However, there are also costs to increasing the size of a prison gang. Gangs must be concerned with the bargaining costs inherent in the division of the gang’s profits and the general cohesion and solidarity necessary for effective gang operation. Internal conflict reduces the effectiveness of the gang, and in fact, is a major obstacle to their successful operation (see, for instance, United States v Shryock *et al.*, 2003). Inmates might no longer uphold each other’s responsibilities, making trade less possible. Internal fighting will make the organized trafficking and sale of drugs more difficult (United States v Shryock *et al.*, 2003; Mendoza, 2012). These costs are an increasing function of a group’s heterogeneity and, therefore, its size within a fixed prison population (Buchanan, 1965; Buchanan and Tullock, 1962).⁹ These increased bargaining costs are reflected by the cost function $\beta(n)$ in Figure 1.

The existence of the $\beta(n)$ function hampers the possibility of a natural monopoly on contraband within a given prison population, as average costs are increasing rather than decreasing when the gang grows beyond k^* (as illustrated in Figure 1). A limit to cost-efficient growth in gang size suggests an oligopolistic structure, whereby the overall prison population forms cooperative groups of approximate size k^* .¹⁰

Given an arbitrary, optimal gang size, k^* , consider the basis for gang organization. Each individual inmate within a fixed prison population of size N has an arbitrary number, M , of exogenous characteristics including race, geographic origin, street gang affiliation, human and social capital, and prior criminal record. Each inmate also has an endogenous level of potential commitment to a prison gang (which is the

⁸ The existence of independent smugglers may, however, limit the degree of mark-up on gang-provided contraband. Prison gangs typically drive out sole proprietors (Irwin, 1980, p. 211).

⁹ This relates more generally to the literature on clubs (Cornes and Sandler, 1996) and how they promote group contributions in a variety of settings (Iannaccone, 1992; Berman, 2000; Berman and Laitin, 2008).

¹⁰ While the specific shape of the cost functions in Figure 1 is open to speculation, prison gangs both exist and are several within any given prison, thereby ruling out the possibility of a corner solution to the gang’s cost minimization problem.

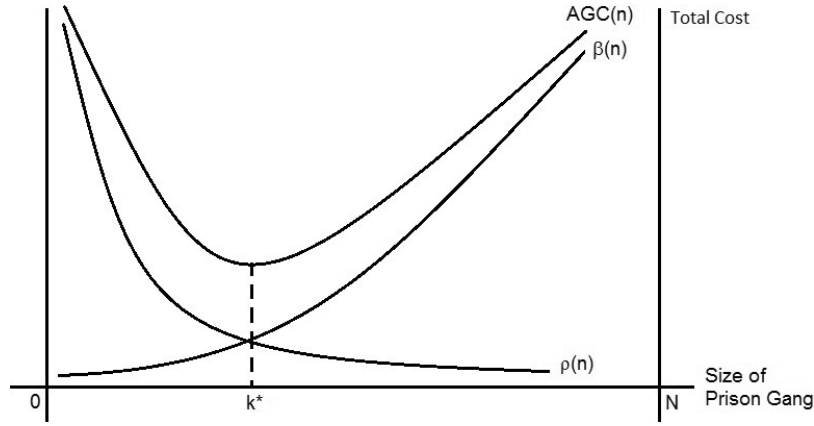


Figure 1. Prison gang costs as a function of gang size.

inverse of commitment to all other social affiliations and non-gang, moneymaking enterprises). These attributes can be expressed in the matrix:

$$X_{n,m} \equiv \begin{matrix} & x_{1,1} & x_{1,2} & \cdots & x_{1,M} & d_1 \\ & x_{2,1} & x_{2,2} & \cdots & x_{2,M} & d_2 \\ & \cdots & \cdots & \cdots & \cdots & \cdots \\ & x_{N,1} & x_{N,2} & \cdots & x_{N,M} & d_n \end{matrix}$$

where $x_{n,m}$ is exogenous attribute m of inmate n and d_n is the endogenous level of potential gang commitment by n .

Insofar as exogenous characteristics are unrelated to the scale economies captured in the function $\rho(n)$, gangs will organize around the attribute or attributes which allow for gang categories that: (i) minimize bargaining costs and maximize cohesion for any given gang size and (ii) divide the prison population into groups of approximately cost-efficient size, k^* . As in the organization of terrorist groups, cultural considerations are often an effective mechanism for promoting internal cohesiveness (Munger, 2006, see also Landa, 1981, 1994; Bernstein, 1992). A race-based system carries the added advantage of quickly identifying gang affiliation to other inmates.

An organizational system based on one exogenous characteristic may, however, yield gangs that are either considerably larger or smaller than k^* . In such cases, auxiliary exogenous factors will be used to break up excessively large gangs or to consolidate excessively small gangs. In California, for example, the existence of a single Hispanic gang within many prisons would be untenably large. Consequently,

geography is employed as a secondary criterion that segments the broader Hispanic inmate population into smaller, more efficient groups. Hispanic inmates sort into gangs based on whether they come from northern California, southern California, or the Fresno area. Conversely, Irish-American or German-American gangs would likely be inefficiently small, thus “white” gangs consolidate these negligible factions into a larger, more effective subgroup of inmates.

Exogenous factors may also be employed *ex post*, notably via the practice of gang tattooing. Such non-reversible acts of gang allegiance serve dual purposes within the previous formal framework. First, gang tattoos create an exogenous and wholly gang-specific attribute that transcends the mere gang eligibility associated with membership in a particular exogenous category. In other words, tattoos create a superior and exogenous “gang member” category that further minimizes bargaining costs. The introduction of this practice shifts down the bargaining costs of an increased gang membership, thereby expanding optimal gang size. Second, tattoos and other non-revocable acts of solidarity identify those inmates whose *ex ante* level of commitment, d_n , was high. Gangs can thereby separate eligible members into those of high and low endogenous commitment to the gang, diminishing the operational costs of gang activity for any given gang size (see Iannaccone, 1992; D’Amico, 2008; Gambetta, 2009).¹¹

3.2 The Role of the Warden

Despite the prospective benefits of forming and maintaining gangs of optimal size, inmate activity is subject to surveillance and interference by prison authorities, which we encapsulate for the purposes of the model within the person of the prison warden. For the warden, there are several potential benefits from the existence of prison gangs. They provide relatively peaceable dispute resolution amongst inmates. Gangs wish to avoid riots and conceal fistfights. Gangs also help allocate scarce prison resources, such as benches and basketball courts, in the face of a shortage of such amenities. While a drastic reduction in the inmate population might ease such tensions, there is good reason to believe that under prevailing circumstances, the optimal number of prison gangs from the perspective of the warden is *not* zero. As Buchanan (1972) observes in relation to the activities of organized crime, a

¹¹ Questions of gang hierarchy as such are beyond the scope of our analysis. However, one would naturally suppose that the same problems of size and associated heterogeneity that make profit division and cohesion difficult introduce a destabilizing chasm between the highest and lowest ranks of gang membership (Leeson and Skarbek, 2010).

monopoly is socially desirable when the industry in question produces bads rather than goods. From the warden's perspective, the smuggling of contraband is a bad. Officials will also prefer an oligopolistic market over a competitive one if officials can engage in corrupt practices, such as extracting bribes from prison drug dealers, because total profits and, hence, potential bribes will be higher. A contraband market comprised of a few, large gangs acting as an oligopoly is therefore likely to be preferable to a large pool of independent dealers, insofar as scale economies do not significantly shift the supply function outward.¹²

The horizontal axis in Figure 2 spans the potential number of prison gangs running from one (a monopoly on contraband and dispute resolution) to N (no gang organization whatsoever). The curve $c(g)$ depicts the increasing cost to the warden of both suppressing contraband and allocating inmate amenities as the numbers of gangs increases. Also included is the cost of monitoring gang activity, which would naturally increase as the number of gangs under surveillance increases. As the number of gangs approaches N (where each inmate is a "gang of one") the situation is costly for the warden because of a highly competitive contraband market coupled

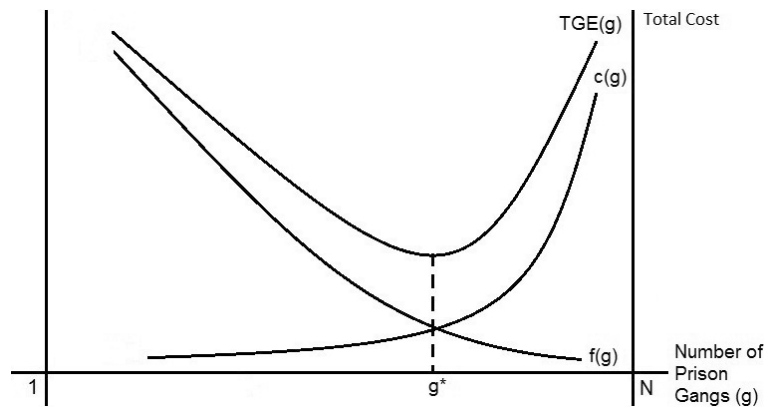


Figure 2. Costs to warden as a function of the number of gangs.

¹² This shift is more likely at the small-scale stages of contraband organization, where a minimal amount of "teamwork" may yield tremendous reductions in cost. Thus, the warden may prefer no cooperation whatsoever (i.e., every inmate his own gang) or the existence of three gangs (where oligopolistic restrictions in the quantity of contraband are meaningful) to the existence of nine gangs (where scale economies operate but a competitive environment keeps prices low and output high).

with a lack of gang-provided mechanisms for dispute resolution and public resource allocation.

The power for inmates to settle their own disputes is, however, a double-edged sword, as this same power can also be used to challenge the control of the warden. Intra-gang disputes, which are more likely as the size and associated heterogeneity of the gang increase, may also require the intervention of prison authorities. For instance, infighting within the Mexican Mafia and the Nuestra Familia require extra staff, attention, and security to control (Blatchford, 2008; Mendoza, 2012). Thus, the costs of internal and external gang friction, $f(g)$, are decreasing in the number of prison gangs. As in the case of optimal gang size, total gang externalities (TGE) are minimized somewhere between no gang organization whatsoever ($g = N$) and a single, monopolistic gang ($g = 1$).

The existence of joint, U-shaped cost curves, both to inmates with respect to gang size and the warden with respect to the number of gangs (presumed to be a decreasing function of gang size), imply that the warden may be in one of three situations: (I) the number of gangs is of approximately optimal size such that g is approximately equal to g^* . (II) g is far greater than g^* , implying that gangs are too numerous. (III) g is far lower than g^* , implying that gangs are too few and, accordingly, too large.

Scenario I does not create significant problems for the warden. Scenario II implies that prison resources should be used to eliminate existing prison gangs. Increasing administrative pressure on the leaders of marginal gangs may provoke dissolution, which will directly diminish the number of prison gangs.¹³ Section 2 provided evidence of “off the record” gang membership advice as commonly given to new inmates by prison authorities. Accordingly, correctional officers could steer or pressure inmates into joining only a few specific gangs. Alternatively, increased pressure on marginal members of smaller gangs which share primary attributes (e.g., race but not geography) may shrink these gangs to the extent that their consolidation by alliance is mutually advantageous. In addition, facilitation of gang bargaining and commitment mechanisms will shift down the $\beta(n)$ curve, which will encourage the expansion of existing gangs.

Lastly, Scenario III implies that prison resources should be used to split up existing gangs (insofar as such factionalization does not cause excessive rancor and

¹³ Of course, continued pressure may be needed to prevent the spontaneous reformation of potentially “dormant” gangs once dissolved.

thereby exacerbate gang externalities).¹⁴ As per the X matrix, strategic separation of race-based gangs may facilitate their further division, for example by geography. Alternatively, a general prison crackdown that makes intra-gang bargaining more costly will put pressure on “excessively” large gangs to shed marginal members.

4 Conclusion

Data on the number of gangs and the number of gang members is one of the most elusive figures in criminal justice studies (Trulson *et al.*, 2006, p. 26). No reliable data exist. However, the theory of the organization of gangs suggests several empirical predictions. First, gangs ought to be approximately similar in size for different racial groups. This will be true even when their relative proportion of the prison population differs. Second, the presence and number of prison gangs depends on the size of the prison population rather than the size of the general population in the community. This would explain why the presence of street gangs is a poor predictor of a state’s prison gang presence and activity (Skarbek, 2013). Third, riots and other displays of public violence should be less frequent when gangs exist. Riots disrupt illicit exchange, so gangs have an incentive to control them. Consistent with this claim, the rate of inmate homicides and prison riots have been declining since the 1970s, at the same time as gangs have proliferated (Useem and Piehl, 2008, p. 94). It may be that other factors explain some or all of this trend, but it is consistent with the argument offered here. Fourth, the theory suggests a positive relationship between gangs and the amount of illicit trade in prison. Consistent with this, gangs are the major source of illicit contraband in prisons (Camp and Camp, 1985). Because of the lack of data, each of these is speculative, but unlike explanations that rely on inmates’ violent or racist nature, it is consistent with broader empirical trends. Lastly, the dual-perspective nature of the theory dictates both an optimal gang size and an optimal number of gangs. In tandem, these joint optima suggest an ideal number of inmates for the minimization of gang friction that is independent of the physical prison facility. Thus, all things being equal, especially large *and* small prison populations should prove most troublesome for authorities to manage.

¹⁴ We are reluctant to suggest that the warden should or is likely to actually encourage the formation of gangs amongst unaffiliated inmates, as this may solve the problem of diffusing the power of existing gangs but does not diminish the externalities from conflict within existing and “excessively” large gangs.

We have examined an unusual context to understand a more general problem — impersonal exchange. Prisons force strangers to interact with each other, and many inmates choose to participate in contraband markets. They cannot rely on formal mechanisms of governance to provide social control in many of these interactions. In California, inmates rely on gangs and other inmate groups to define and enforce property rights, adjudicate disputes, and facilitate trade. Rather than viewing these groups as forming to promote violence or racism, we argue that gangs play an important, productive, and contractual role in the prison community. By operating in a CRS, gangs help inmates to capture the benefits of mutually beneficial exchange. From the inmates' perspectives, this enhances welfare. The effectiveness of a CRS is not dependent on agents having a relatively cooperative type. Finally, from the perspective of prison authorities, the optimal number of prison gangs is not zero. They too can benefit from the peaceful resolution of disputes, even if they do not value greater market satisfaction for illicit contraband.

References

- Anderson, T. L. and P. J. Hill. 2004. *The Not So Wild, Wild West*. Stanford, CA: Stanford University Press.
- Axelrod, R. 1984. *The Evolution of Cooperation*. New York: Basic Books.
- Bernstein, L. 1992. "Opting Out of the Legal System: Extralegal Contractual Relations in the Diamond Industry." *Journal of Legal Studies* 21(1): 115–157.
- Benson, B. L. 1989. "The Spontaneous Evolution of Commercial Law." *Southern Economic Journal* 55: 644–661.
- Benson, B. L. 1990. *The Enterprise of Law: Justice without the State*. San Francisco: Pacific Research Institute for Public Policy.
- Berman, E. 2000. "Sect, Subsidy, and Sacrifice: An Economist's View of Ultra-Orthodox Jews." *The Quarterly Journal of Economics* 115(3): 905–953.
- Berman, E. and D. Laitin. 2008. "Religion, Terrorism, and Public Goods: Testing the Club Model." *Journal of Public Economics* 92(10–11): 1942–1967.
- Blatchford, C. 2008. *The Black Hand: The Bloody Rise and Redemption of "Boxer" Enriquez*. William Morrow Paperbacks.
- Buchanan, J. 1965. "An Economic Theory of Clubs." *Economica* 32(125): 1–14.
- Buchanan, J. 1972. "A Defense of Organized Crime?" In *The Economics of Crime and Punishment*. S. Rottenberg, (ed.), American Enterprise Institute, pp. 119–132.
- Buchanan, J. and G. Tullock. 1962. *The Calculus of Consent*. Ann Arbor: University of Michigan Press.
- Bunker, E. 2000. *Education of a Felon: A Memoir*. St. Martin's Griffin.
- Bush, W. C. and L. S. Mayer. 1974. "Some Implications of Anarchy for the Distribution of Property Rights." *Journal of Economic Theory* 8: 401–412.
- Byrne, J. and D. Hummer. 2007. "In Search of the 'Tossed Salad Man' (and Others Involved in Prison Violence): New Strategies for Predicting and Controlling Violence in Prison." *Aggression and Violent Behavior* 12: 531–541.

- California Department of Corrections. 1975. "Prison Violence in California: Issues and Alternatives." State of California, Department of Finance, Program Evaluation Unit.
- California Department of Corrections and Rehabilitation. 2012a. "CDCR Awards System-wide Telephone Contract That Will Restrict Cellular Phones in Prisons." Press Release. 16 April 2012.
- California Department of Corrections and Rehabilitation. 2012b. "Security Threat Group Prevention, Identification and Management Strategy." March 1.
- California Council on Science and Technology. 2012. "The Efficacy of Managed Access Systems to Intercept Calls from Contraband Cell Phones in California Prisons."
- Camp, G. M. and C. Camp. 1985. *Prison Gangs: Their Extent, Nature, and Impact on Prisons*. U.S. Department of Justice, Federal Justice Research Program.
- Clay, K. 1997. "Trade without Law: Private-Order Institutions in Mexican California." *Journal of Law, Economics, and Organization* 13: 202–231.
- Cornes, R. and T. Sandler. 1996. *The Theory of Externalities, Public Goods, and Club Goods*. Cambridge University Press.
- D'Amico, D. J. 2008. "Tattoo Prohibition Behind Bars: The Case for Repeal." *The Journal of Private Enterprise* 23(2): 113–134.
- Dixit, A. 2004. *Lawlessness and Economics: Alternative Modes of Governance*. Princeton University Press.
- Ellickson, R. 1991. *Order without Law: How Neighbors Settle Disputes*. Cambridge, MA: Harvard University Press.
- Fearon, J. D. and D. D. Laitin. 1996. "Explaining Interethnic Cooperation." *American Political Science Review* 90(4): 715–735.
- Federal Bureau of Investigation. 2012. "Aryan Brotherhood" Freedom of Information Act File.
- Friedman, D. 1979. "Private Creation and Enforcement of Law: A Historical Case." *Journal of Legal Studies* 8: 399–415.
- Fudenberg, D. and E. Maskin. 1986. "The Folk Theorem in Repeated Games with Discounting or with Incomplete Information." *Econometrica* 54(3): 533–554.
- Gaes, G. G., S. Wallace, E. Gilman, J. Klein-Saffran, and S. Suppa. 2002. "The Influence of Prison Gang Affiliation on Violence and Other Prison Misconduct." *The Prison Journal* 82(3): 359–385.
- Gambetta, D. 1993. *The Sicilian Mafia: The Business of Private Protection*. Harvard University Press.
- Gambetta, D. 2009. *Codes of the Underworld: How Criminals Communicate*. Princeton University Press.
- Glaeser, E. L. 1998. "Economic Approach to Crime and Punishment." In *The New Palgrave Dictionary of Economics and the Law*. P. Newman, (ed.), London: MacMilan, pp. 1–6.
- Goodman, P. 2008. "'It's Just Black, White, or Hispanic': An Observational Study of Racializing Moves in California's Segregated Prison Reception Centers." *Law & Society Review* 42(4): 735–770.
- Greif, A. 1989. "Reputation and Coalitions in Medieval Trade: Evidence on the Maghribi Traders." *Journal of Economic History* 49: 857–882.
- Greif, A. 1993. "Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition." *American Economic Review* 83: 525–548.
- Greif, A. 2004. "Impersonal Exchange without Impersonal Law: The Community Responsibility System." *Chicago Journal of International Law* 5: 109–138.
- Greif, A. 2006a. "The Birth of Impersonal Exchange: The Community Responsibility System and Impartial Justice." *Journal of Economic Perspectives* 20(2): 221–236.
- Greif, A. 2006b. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge University Press.

- Habyarimana, J., M. Humphreys, D. Posner, and J. Weinstein. 2007. "Why Does Ethnic Diversity Undermine Public Goods Provision." *American Political Science Review* 101(4): 709–725.
- Hirshleifer, J. 1995. "Anarchy and Its Breakdown." *Journal of Political Economy* 103: 26–52.
- Hirshleifer, J. 2001. *The Dark Side of the Force*. New York: Cambridge University Press.
- Hunt, G., S. Riegel, T. Morales, and D. Waldorf. 1993. "Changes in Prison Culture: Prison Gangs and the Case of the 'Pepsi Generation.'" *Social Problems* 40(3): 398–409.
- Iannaccone, L. R. 1992. "Sacrifice and Stigma: Reducing Free-Riding in Cults, Communes, and Other Collectives." *Journal of Political Economy* 100(2): 271–291.
- Irwin, J. 1980. *Prisons in Turmoil*. Boston, MA: Little, Brown, & Co.
- Johnson v. California. 2005. 543 U.S. 499.
- Jones, G. 2008. "Are Smarter Groups More Cooperative? Evidence from Prisoner's Dilemma Experiments, 1959–2003." *Journal of Economic Behavior & Organization* 68: 489–497.
- Kaminski, M. 2003. "Games Prisoners Play: Allocation of Social Roles in a Total Institution." *Rationality and Society* 15(2): 188–21.
- Kaminski, M. 2004. *Games Prisoners Play: The Tragicomic Worlds of Polish Prisons*. New Jersey: Princeton University Press.
- Kalinich, D. B. 1980. *Power, Stability, and Contraband: The Inmate Economy*. Waveland Press Inc.
- Kalinich, D. B. and S. Stojkovic. 1985. "Contraband: The Basis for Legitimate Power in a Prison Social System." *Criminal Justice and Behavior* 12(4): 435–451.
- Knox, G. W. 2006. *An Introduction to Gangs*. 6th edn. National Gang Crime Research Center.
- Koyama, M. 2012. "Prosecution Associations in Industrial Revolution England: Private Providers of Public Goods?" *Journal of Legal Studies* 41(1): 95–130.
- Landa, J. 1981. "A Theory of Ethnically Homogenous Middleman Group: An Institutional Alternative to Contract Law." *Journal of Legal Studies* 10: 349–362.
- Landa, J. 1994. *Trust, Ethnicity, and Identity*. Ann Arbor: University of Michigan Press.
- Lee, D. S. and J. McCrary. 2005. "Crime, Punishment, and Myopia" NBER Working Paper #11491.
- Leeson, P. T. 2005. "Endogenizing Fractionalization." *Journal of Institutional Economics* 1(1): 75–98.
- Leeson, P. T. 2005b. "Self-Enforcing Arrangements in African Political Economy." *Journal of Economic Behavior and Organization* 57(2): 241–244.
- Leeson, P. T. 2006. "Cooperation and Conflict: Evidence on Self-Enforcing Arrangements and Heterogeneous Groups." *American Journal of Economics and Sociology* 65(4): 891–907.
- Leeson, P. T. 2007a. "An-arrgh-chy: The Law and Economics of Pirate Organization." *Journal of Political Economy* 115(6): 1049–1094.
- Leeson, P. T. 2007b. "Trading with Bandits." *Journal of Law and Economics* 50: 303–321.
- Leeson, P. T. 2008. "Social Distance and Self-Enforcing Exchange." *Journal of Legal Studies* 37(1): 161–188.
- Leeson, P. T. 2009a. *The Invisible Hook: The Hidden Economics of Pirates*. Princeton University Press.
- Leeson, P. T. 2009b. "The Laws of Lawlessness." *Journal of Legal Studies* 38(2): 471–503.
- Leeson, P. T. 2010. "Pirational Choice: The Economics of Infamous Pirate Practices." *Journal of Economic Behavior and Organization* 76(3): 497–510.
- Leeson, P. and D. Skarbek. 2010. "Criminal Constitutions." *Global Crime* 11(3): 279–298.

- Levin, M. 1996. "The Prisoners of the War on Drugs." Home Box Office Documentary. Release Date: 8 January 1996.
- Lyman, M. D. 1989. *Gangland*. Springfield, IL: Charles C Thomas.
- Mendoza, J. 2012. *Nuestra Familia: A Broken Paradigm*. Create Space Publishers.
- Milgrom, P. R., D. C. North, and B. R. Weingast. 1990. "The Role of Institutions in the Revival of Trade: The Medieval Law Merchant, Private Judges, and the Champagne Fairs." *Economics and Politics* 1: 1–23.
- Morales, G. C. 2008. *La Familia — The Family: Prison Gangs in America*. San Antonio, TX: Mungia Printers.
- MSNBC. 2005a. "Inside Wabash." Lockup. Airdate: December 3.
- MSNBC. 2008. "The Convict Code." Lockup Raw. Airdate: February 25.
- MSNBC. 2009. "Ganging Up." Lockup Raw. Airdate: May 16.
- MSNBC. 2010. "Dues and Don'ts." Lockup Raw. Airdate: April 24.
- Munger, M. C. 2006. "Preference Modification vs. Incentive Manipulation as Tools of Terrorist Recruitment: The Role of Culture." *Public Choice* 128(1–2): 131–146.
- Ostrom, E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press.
- Petersilia, J. 2006. *Understanding California Corrections*. California Policy Research Center. University of California.
- Pinker, S. 2012. *The Better Angels of Our Nature: A History of Violence and Humanity*. Penguin Press.
- Powell, B. and E. Stringham. 2009. "Public Choice and the Economic Analysis of Anarchy: A Survey." *Public Choice* 140(3–4): 503–538.
- Pratt, T. C. and F. T. Cullen. 2000. "The Empirical Status of Gottfredson and Hirschi's General Theory of Crime: A Meta-Analysis." *Criminology* 38(3): 931–964.
- Radford, R. A. 1945. "The Economic Organization of a P.O.W. Camp." *Economica* 12(48): 189–201.
- Richman, B. 2006. "How Community Institutions Create Economic Advantage: Jewish Diamond Merchants in New York." *Law and Social Inquiry* 21(2): 383–420.
- Schaeffer, E. C. 2008. "Remittances and Reputations in Hawala Money-Transfer Systems: Self-Enforcing Exchange on an International Scale." *Journal of Private Enterprise* 24(1): 95–117.
- Schelling, T. 1971. "What is the Business of Organized Crime?" *Journal of Public Law* 20(71): 71–84.
- Skaperdas, S. 1992. "Cooperation, Conflict, and Power in the Absence of Property Rights." *American Economic Review* 82: 720–739.
- Skaperdas, S. 2001. "The Political Economy of Organized Crime: Providing Protection when the State does Not." *Economics of Governance* 2(3): 173–202.
- Skaperdas, S. and C. Syropoulos. 1995. "Gangs as Primitive States." In *The Economics of Organised Crime*. G. Firoentini and S. Peltzman, (eds.), Cambridge University Press.
- Skarbek, D. 2010a. "Putting the 'Con' Into Constitutions: The Economics of Prison Gangs." *Journal of Law, Economics & Organization* 26(2): 183–211.
- Skarbek, D. 2010b. "Self Governance in San Pedro Prison." *The Independent Review* 14(4): 569–585.
- Skarbek, D. 2011. "Governance and Prison Gangs." *American Political Science Review* 105(4): 702–716.
- Skarbek, D. 2012. "Prison Gangs, Norms, and Organizaitons." *Journal of Economic Behavior and Organization* 82(1): 96–109.
- Skarbek, D. 2013. *The Social Order of the Underworld: How Prison Gangs Govern the American Prison System*. Manuscript. King's College London.

- Sobel, R. and B. Osoba. 2009. "Youth Gangs as Pseudo-Governments: Implications for Violent Crime." *Southern Economics Journal* 75(4): 996–1018.
- Stringham, E. 2003. "The Extralegal Development of Securities Trading in Seventeenth-Century Amsterdam." *The Quarterly Review of Economics and Finance* 43(2): 321–344.
- Sutter, D. 1995. "Asymmetric Power Relations and Cooperation in Anarchy." *Southern Economics Journal* 61(3): 602–613.
- Sykes, G. M. 1958 [2007]. *The Society of Captives: A Study of a Maximum Security Prison*. Princeton University Press.
- Trammell, R. 2009. "Values, Rules, and Keeping the Peace: How Men Describe Order and the Inmate Code in California Prisons." *Deviant Behavior* 30: 746–771.
- Trammell, R. 2011. *Enforcing the Convict Code: Violence and Prison Culture*. Lynne Rienner Publishers.
- Trulson, C. R., J. W. Marquart, and S. K. Kawucha. 2006. "Gang Suppression and Correctional Control." *Corrections Today*. April.
- Tullock, G. 1985. "Adam Smith and the Prisoners' Dilemma." *Quarterly Journal of Economics* 100: 1073–1081.
- United States v Shryock *et al.* 2003. 342 F. 3d 948, Court of Appeals, 9th Circuit.
- Umbeck, J. 1977a. "A Theory of Contract Choice and the California Gold Rush." *Journal of Law & Economics* 20(2): 421–437.
- Umbeck, J. 1977b. "The California Gold Rush: A Study of Emerging Property Rights." *Explorations in Economic History* 14: 197–226.
- Umbeck, J. 1981. "Might Makes Right: A Theory of the Formation and Initial Distribution of Property Rights." *Economic Inquiry* 19: 38–59.
- Useem, B. and A. M. Piehl. 2006. "Prison Buildup and Disorder." *Punishment and Society* 8: 87–115.
- Useem, B. and A. M. Piehl. 2008. *Prison State: The Challenge of Mass Incarceration*. Cambridge University Press.
- Valentine, B. 2000. *Gangs and Their Tattoos: Identifying Gangbangers on the Street and in Prison*. Boulder, CO: Paladin Press.
- Varese, F. 2005. *The Russian Mafia: Private Protection in a New Market Economy*. Oxford University Press.
- Varese, F. 2011. *Mafias on the Move: How Organized Crime Conquers New Territories*. Princeton University Press.
- Washington Times. 2010. "Drugs Inside Prison Walls." January 27.